TEST REPORT

Single Event Transients
UT54LVDS031/32

Brookhaven National Laboratory

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1. Objective

To test the UT54LVDS031 driver and the UT54LVDS032 receiver for single event transients using heavy ions.

2. Parts

Two evaluation boards were purchased from Aeroflex, each containing a driver and receiver. The boards contained 3.3 V parts. In addition some 5 V parts were tested by removing the 3.3 V parts and changing the supply voltages. The date and lot codes are shown in Table 1.

Table 1.
Date and Lot Codes

Device	Date and Lot Code
UT54LVDSCO31-UCC (5.0V)	0443
UT54LVDSC032-UCC (5.0V)	0433
UT54LVDS031LV-UPC (3.3V)	0335
UT54LVDS032LV-UPC (3.3V)	0333

3. Test Facility and Ions Used

Testing was carried out at Brookhaven National Laboratory. The metal covers on the parts were removed and the entire test setup was mounted inside the vacuum. The parts were exposed to 320 MeV Iodine ions with maximum LETs of 84.96 MeV·cm^2/mg at an angle of 45 degrees. The fluence in each run was 1x10^6 /cm^2.

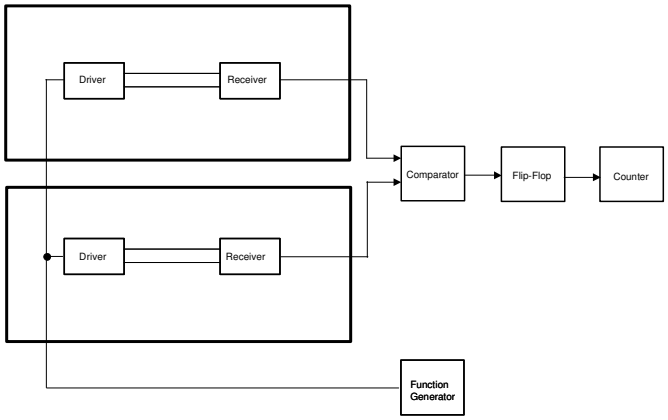

Fig. 1. Experimental configuration used to test the Aeroflex drivers and receivers for single event transients. The function generator supplied a 15 MHz square wave to the inputs of the two drivers. The comparator toggled when the two differed. Each toggle was captured in a flip-flop and counted with a counter.

4. Experimental Configuration

Two evaluation boards were mounted together, side-by-side. Each board contained a driver and receiver. Two different configurations were tested. In one, a 15 MHz square wave signal was applied to the inputs of the two drivers. The outputs of the receivers were connected to a comparator and the output values compared. If a SET occurred in either a driver or receiver, the two outputs would differ. That would cause the comparator to toggle, which would, in turn, be

registered in the flip-flop and then the counter. After each SET, the flip-flop was reset. An oscilloscope was also connected to the output of the comparator, and any glitch would trigger the oscilloscope. Fig. 1 shows the experimental setup.

In the second configuration only one of the evaluation boards was used. A DC voltage was applied to the input of a transmitter and the output was monitored with an oscilloscope. The comparator was disconnected. Any glitch on the DC output would trigger the oscilloscope and be registered as a SET. The trigger level was set to 0.5 volts.

5. Results

No SETs were registered for any part, whether transmitter or receiver, 5.0 Volts or 3.3 Volts or whether operating with a square wave input or DC input.

6. Results

In general, devices are categorized based on heavy ion test data into one of the f our following categories:

Category 1 – Recommended for usage in all NASA/GSFC spaceflight applications.
Category 2 – Recommended for usage in NASA/GSFC spaceflight applications, but may require mitigation techniques.
Category 3 – Recommended for usage in some NASA/GSFC spaceflight applications, but requires extensive mitigation techniques or hard failure recovery mode.
Category 4 – Not recommended for usage in any NASA/GSFC spaceflight applications.

Based on results of proton testing and previous heavy ion data, this part is assigned to category 1.